SUPPLEMENTAL REPORT
TO THE CULTURAL RESOURCE INVENTORY OF THE
RAILROAD TIE PLANT IN SOMERS, MONTANA

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FINAL REPORT

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Prepared for

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INTRODUCTION

The following description of the treating method applied at the Somers tie plant is based on technical reports prepared by Remediation Technologies, Inc. (ReTec) and Historical Research Associates, Inc. in 1986 and 1988.[1] This material is supplemented with information gained from interviews with "tie bucker" and treating engineer Tom Bennett (employed from 1925 until 1959)[2], treating engineer Percy Fine (employed 1949-1972); Adzing and Boring Mill operator Richard Keller (employed 1969-1985); locomotive operators Mike Cash (employed 1963-1979) and Kenneth Daly (employed 1969-1985), and boiler-room maintenance man Norm Lyons (employed 1969-1985).

Ann Hubber conducted the interview with Mr. Lyons in his home in Kalispell, and the interview with Fine, Keller, Cash, and Daly on the grounds of the Somers tie yard. This supplemental report is designed to be used with the collection of historical maps and HAER photographs compiled as part of the Memorandum of Agreement. Further technical information is available in the ReTec (1986) and HRA (1988) reports.

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[1] "Cultural Resource Inventory of the Railroad Tie Plant In Somers, Montana," prepared by Historical Research Associates, Missoula, Montana, October 1988.
"Task Completion Report: Site History of the Somers Tie Plant," prepared by Remediation Technologies, Inc., Kent, Washington, November 1986.

[2] The Bennett interview, conducted by Laurie Mercier on December 3, 1981, is on file at the Montana Historical Society library, Helena, Mt.

1.0 Historical Background Information--Association of the Tie Plant with the Town of Somers.

The town of Somers, located on a low forested ridge on the north shore of Flathead Lake, developed around the 1900-1901 construction of the Great Northern Railway tie plant and the O'Brien sawmill, which provided the tie plant with softwood ties.[3] The Great Northern recruited many of the employees needed for the two inter-connected industrial operations from Norwegian, Italian, and German communities in Minnesota, home state of the Great Northern Railway. The Company provided housing (or leased land upon which to build a house) and later water and electricity, for the 300+ mill workers and the 35-50 tie yard workers. Provisions were available at the Company store--as was credit when the mill or yard were not operating. "They'd pay us 32 cents an hour [circa 1935] and we'd work and save all summer and then they'd take it all to pay our grocery bill in the winter .... And they'd only allow you to buy certain things. Flour, potatoes, eggs. Candy and all that stuff--they didn't have much of that" (Fine 1990). Protection from unspecified outside influences was provided by a 10-foot fence which enclosed the town until the late 1930s. The fence gates were locked between 10 p.m. and 6 a.m.

The Lumber and Sawmill Workers Union (Local 1965)--"we couldn't get on with the railroad union" (Daly 1990)--was introduced in the late 1940s despite the Company fence and the Company's use of "stoodges" (Bennett 1981). Tom Bennett believed that:

> Unions did have power on some working conditions. [They] didn't pressure people to join because everybody wanted to join. Under the old method before we had unions, why an employer could do anything he wanted to. Make any rules he wanted to. After the unions got to operating that more or less done away with that ... Before the unions, [if you got hurt] the Company used the threat of firing (Bennett 1981).

However, Cash, Daly, Fine, Keller, and Lyons perceived the union as generally ineffective. Daly alleged that "We didn't have as much money as the west coast guys did" (Daly 1990) and Lyons argued that "they didn't have too much power. The union was pretty weak" (Lyons 1990).

Despite this perceived lack of an effective bargaining force, a general consensus among those interviewed was that "it was a good job--steady and they paid pretty good"

[3] Generally, the Great Northern used fir and western pine for straight segments of track, and hardwood, shipped to the plant from Minnesota and points east, for steep grade and corner ties. (Daly 1990).

(Lyons 1990). Bennett recalled that "there was no turn over. People were glad to get a job and stayed for years ... There wasn't anything I disliked about my job. The work was mostly routine and you put in so many hours. There was nothing to be dissatisfied about" (Bennett 1990). This routine and the nature of those hours are described below.

2.0 The Treatment Process

From 1901 until 1927, ties were treated with a zinc chloride treatment. The early Somers tie plant, unmodified between 1901 and 1926, was designed by Chicago civil engineer Samuel M. Rowe. Rowe based his design on the "Zinc Tannin" or "Wellhouse" treating process, adapting it somewhat to accommodate the greater density of western pine and Douglas fir. The completed plant, built to process 4000 ties per day, consisted of two tie storage yards--one for untreated "green" ties, the other for treated "black" ties. These yards were connected to the main treating plant by electrified, narrow gauge trolley lines. The Great Northern railroad spur, which carried ties to and from the treating plant, lay parallel to both the green and black yards.

The zinc-chloride method began by steaming a retort load, which amounted to 500 ties, with approximately 20 pounds per square inch (psi) of pressure. This activated the sap in the wood. After the steam had been discharged, the sap was withdrawn with a vacuum. Treating engineers then injected a zinc chloride solution into the retorts, at a pressure of 100 pounds psi. When the wood had absorbed a sufficient quantity of the solution, the remainder of the chloride was forced back into its receptacle with compressed air. This process was repeated with a glue solution and then a tannic acid solution. The glue and tannin reacted to form a leathery precipitate, which sealed the zinc chloride.

In 1926, the tie plant was modified to accommodate both the zinc chloride and a creosote treatment method. Two new retorts, larger than the originals, and two "rueping" tanks were added. The rueping tanks held the heated preservatives, were of equal length yet smaller diameter to the new retorts, and were placed above them. The volume of preservative in the rueping tanks would fill a loaded retort. At this time, the building was enlarged to hold the new retorts and rueping tanks; the air compressors were relocated to a new machine room built on the east end of the building. In addition, the three storage tanks were moved about 20 meters north of the retort building; and two short, cylindrical scale tanks were installed beneath and perpendicular to the two retorts. The plant resumed production in January 1927, capable of employing either the zinc-chloride treatment process or a creosote treatment process. Daly (1990) commented that "the guy that designed this place was a genius. Everything is pushed with air pressure or pulled with a vacuum. No pumps are used." The completed facility "contains 500 or more valves and the treating engineer is supposed to know what they do" (Daly 1990). "Supposed to" (Fine 1990).

Furthermore, two steam engines (S-1 and S-2) replaced the electric trolleys that had originally transported ties within the tie plant. The old single gauge tracks were replaced with standard tracks; and an adzing and boring mill ("A & B Mill") was constructed along the railway tracks approximately halfway between the green yard and the treating building. However, with these exceptions, the process of treating ties remained essentially the same from 1901 until the plant closed in 1986. The following description of the treatment process, from green tie to black, details the post-1927 process yet notes when the process differed from that of the pre-1927 period.

Green ties from the O'Brien mill were shipped along the Great Northern track to the "green yard." Here they were unloaded by members of the "green gang"--a crew of 10 to 12 men--and stacked to season for thirty to sixty days. The green gang would also load seasoned ties onto the trams destined for the treating building. Tom Bennett, member of the green gang from 1925 to 1940, recalled that all of the work was piece work. "Tie buckers" would carry ties, often weighing in excess of two hundred pounds, on their shoulders, one at a time. The men were paid 96 cents per hundred ties and could often earn a days wage--approximately $5.00--in six hours (Bennett 1981). Bennett commented that "when we were carrying ties on our shoulder we were doing everything under the worst conditions. We did everything the hard way until they got the Ross lifts [circa 1961]." When asked if men in the green yard would steal the untreated ties, Bennett replied,

> Just stealing in an abstract way: the ones that got to the tram first got to carry ties from the front of the pile and the ones that got there last had to carry ties from the back of the pile. [You] could load the same amount of ties with a huge difference in the output of work (1981).

When the ties had dried sufficiently, the green gang loaded them by hand on to "charges"--a charge consisted of 14 trams, or approximately 800 ties (Daly, Cash 1990). Approximately four charges could be processed per day. Prior to the 1927 modernization of the plant, the charges were conveyed by electrified trolley to the treating plant where they were loaded into the zinc-chloride retorts. Steam engines running on standard gauge tracks were introduced in 1927. These engines had no firebox and did not produce their own steam; steam was periodically pumped on board from a stationary boiler. There were two engine shifts, one operating from 2:30 a.m. until 10:30 a.m. and the other from 10:30 a.m. until 6:30 p.m.

In the later years of operation, replacement parts for the antiquated engines were made in the machine shop connected to the main boiler room (Lyons 1990). The engines were maintained in the north end of the treating building, next to the original retorts. Once a year, during the thirty days when the plant was closed for boiler maintenance, the engine valves would be changed, and seats and brakes checked (Daly, Keller 1990).

After 1927, the loaded trams were hauled to the A & B Mill for processing. In the early years the ties were hand loaded into the mill. After the introduction of hydraulic lifts in the early 1960s, the lift trucks would take the seasoned ties directly from the green yard to the A & B Mill's conveyor belt. The large concrete slab located next to the site of the A & B Mill provided a platform for the lift trucks (Keller 1990). The A & B Mill adzed a flat side on each tie where the rail would sit, then bored holes in the tie in a selected bore size according to the diameter of the pound rail that would be spiked to it. "There were 16 sizes of boring plates" (Keller 1990). Finally, an "incisor machine" made numerous, small incisions on the surface of the ties in order to facilitate infiltration of the preservative. The conveyor belt would then deposit the ties directly onto the waiting trams; two men, one on each side of the trams, would position them with a "pickeroon." The steam engines then pushed the loaded trams from the A & B mill to the massive doors of the retorts.

Richard Keller, who worked in the A & B Mill from 1969 until the early 1980s, recalled that the most memorable "working condition" was the grease, "you were so coated with grease and oil when you were working on the machinery. It was constant. Your coveralls at the end of the week ... they'd almost stand up by themselves" (Keller 1990).

The mechanized wench used to lift the rails from the track into the retorts was not installed until the early 1980s. "Many, many years we would stand here, one man per rail, and pack 'em and slide 'em into the retorts. We never had the electric wench in until the last four years" (Cash, Daly 1990). The heavy, round doors were then sealed by 42 3 1/2 inch bolts which were tightened with a 7-foot long rachet. Mr. Daly said (1990), "I weigh 170 pounds and I could almost swing on the thing." The locomotive drivers and those opening the retorts were both subjected to the heat, smoke, and smell of the newly-treated ties. "If you had the afternoon shift and were pulling retorts and it was 70 degrees outside and the retorts were 190 degrees ... There was a lot of smoke and fumes" (Daly 1990).[4]

The creosote method adopted at the Somers tie plant utilized a mixture of creosote and fuel oil. The percentage of creosote to fuel oil varied with the type of wood being treated and the purpose of use. The compounds were stored separately in large tanks north of the treating plant. Fine remembered (1990) that "we mixed it in the big tank in the back of the [treating building]. They mixed it by weight, by a certain temperature, and a certain gravity. The oil was a little lighter than water but the coal tar that they used was 10 1/2 pounds to the gallon and it had to be mixed equal by volume" (Fine 1990). The precipitate was transported from the holding tanks to the mixing tank to the rueping tanks via underground pipes by either air pressure or vacuum.

Creosote was most often applied using the Lowry method. After the retort had been loaded with ties, it was filled with a heated creosote/fuel oil mixture (approximate temperature was between 180 to 210 degrees fahrenheit) from the rueping tanks mounted directly above the retorts. As the creosote was absorbed into the ties it was replaced with creosote from the scale tank. Air compressors then blew the remaining creosote in the scale tank and the retort tank up to the rueping tank, with about 140 pounds pressure. A vacuum was then applied to the ties in the retort, and the resulting precipitate was drained back into the scale tank (ReTec 1986). What spilled out of the retorts during the normal course of operations was channelled into the basement and vacuumed into the old retorts, where the water was boiled out. The preservative was then returned to the storage tanks (Historical Research Associates 1988). When the retorts were cleaned once a year "[we'd] shovel [the residue] into this [small tram] and take it out and dump it in the yard" (Daly, Cash 1990).

Retired treating engineer Percy Fine recalled that the heat and the smell of creosote and fuel oil dominated the work place (Fine 1990). Daly indicated (1990) that the temperature in the area surrounding the retorts was generally 100 degrees; temperatures up in the catwalks adjacent to the rueping tanks were "probably in excess of 150 degrees. No one ever knew for sure" (Daly, 1990).[5] The treating plant operated 24 hours a day, with

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[4] These working conditions, however, met the Occupational Safety and Health Administration (OSHA) standards. See "Remedial investigation and Feasibility Study for the Somers Tie Plant" (Prepared by Remedial Technologies (ReTec) for Burlington Northern Railroad), April 1989.

[5] ReTec officials indicated that temperatures along the catwalk probably averaged between 100 and 115 degrees (Personal correspondence, Lena Blais to Janene Caywood, October 1990).

a single treating engineer, and two men assigned to opening and closing the retorts and loading the ties, working each eight hour shift.

Industrial spills associated with the treating process were not unknown. Bennett, treating engineer from 1940 to 1959, recalled that "once or twice in the tie treatment plant we had an accident where we opened up the wrong valve and let the solution go all over the floor and had to clean it up again. But I don't remember any accidents where people got hurt." Fine recounted the time that two employees "got in a hurry to open the retorts and the oil wasn't all out of it yet. So they just stood there and watched it run out the front door" into the yard and the treatment building. "It's just lucky I remembered to turn off the sewer valve ... or we would have had 5000 gallons [of creosote] in the lake" (Fine 1990). "Everybody got to clean the building" (Daly 1990).

Occasionally, the cable or chain securing the ties to the retort tram would break during the treating process. It was then necessary, after allowing the retort to cool for at least 24 hours, to send men into the retorts to retrieve those ties which had fallen between the tram and the retort walls. Even with the cool-down, the interior of the retort would be exceedingly hot. When asked how often the cables would break, Daly replied "Oh, it went in cycles, sometimes it happened a lot. Too often" (Daly 1990).

Mr. Cash recounted (1990) that following the treating process, "they'd pull the charges out and spot them out there on the platform. Then these buckers would come to work about 2:30 in the morning and they'd start packing 'em off of the trams into the cars and they'd probably take off about three charges [in eight hours]" (Cash 1990). The black ties would then be stacked in the black yard according to size and species and later loaded into Great Northern flat cars for transport. The piece-work wage was slightly higher than that in the green yard--$1.00 per hundred in the 1930s (Bennett 1981). Cash stated that

> when they [workers in the black yard] got through they'd go over here to the bathhouse and they had a big tub full of coal oil and they'd wash that creosote off with coal oil and then they'd jump in the shower ... A lot of the guys couldn't stand this creosote because it would burn them. If you were tow headed or a blond you could not work around the hot creosote. You'd blister (Cash 1990).

This bathing process continued until the early 1960s when the hydraulic lifts were introduced and the treated ties were no longer handled directly (telephone interview with Kenneth Daly, Nov. 6, 1990).

The physical problems associated with work in the black yard--and the green yard--were also considerable. After years of bucking ties, "about all of them guys, before they passed away, were all humped over ... Everyone that I knew, their hips were all out ... their backs were all gone--crushed vertebrae--... [and their] arches would break" (Cash, Daly 1990).

Steam pressure used to heat the preservative mixtures and run the steam engines was provided by a large boiler located south of the treating building. Maintenance of this system was a 24 hour, year-round responsibility. Prior to installation of the on-site boiler plant (circa 1948),

> it took approximately five different steam-boiler plants to run all the operations in Somers. The big one down by the lake--there were seven boilers down there ... Meno dropped a 48" pipe wrench down the tubes, and it went through to the mud drums. That's how big the tubes were on them big boilers (Cash 1990).

Steam generated at these boilers--using hog shavings from the lumber yard as fuel (telephone interview with Percy Fine, Nov.7, 1990)--was transported from the lake to the tie plant (and from within the tie plant to the various facilities) by large, overhead conduits. Following the 1948 closure of the lumber yard, the current boiler facility, run on fuel oil, was constructed (Fine Nov.7,1990).

Although boiler room work was considered the most dependable--and thus the most desirable--the noise level was "pretty steady" (Lyons 1990). "In the treating plant they had the heat, but in the boiler room they had the noise" (Daly 1990). When not working on the boilers themselves, the mechanics fashioned replacement parts for the steam engines (Lyons 1990).

The Somers tie plant was closed in July of 1986. Employees were told that a computer had indicated that hardwood ties, more efficiently processed in the East, closer to the timber source, were more effective (Cash et al, Lyons 1990). Most of the thirty-plus employees of the tie plant moved out of area following the closure of the Somers tie plant (Daly, Keller 1990).

HUPPE:REV